$i(t) = I_m \sin(\omega t + \varphi_i)$

$I_m = \frac{U_{R_m}}{R} = \frac{2,5}{200} = 1,25.10^{-2} A$

φ_i ?

$\varphi_u - \varphi_i = \frac{\pi}{4}$ or $\varphi_u = 0 \Rightarrow \varphi_i = -\frac{\pi}{4} rad$

$d'où$ $\boxed{i(t) = 1,25.10^{-2} \sin(500\pi t - \frac{\pi}{4})}$

b- $Z = \frac{U_m}{I_m} = \frac{4}{1,25.10^{-2}} = 320\Omega$

c- $\cos(\varphi_i - \varphi_u) = \frac{(R+r)}{Z}$

$r = Z\cos\Delta\varphi - R$

$= 320\cos\frac{\pi}{4} - 200$

$r = 26,27\Omega$

$\boxed{tg(\varphi_i - \varphi_u) = \frac{\frac{1}{C\omega} - L\omega}{R+r}}$

$\frac{1}{C\omega} - L\omega = (R+r)tg(\varphi_i - \varphi_u)$

$L\omega = \frac{1}{C\omega} - (R+r)tg(\varphi_i - \varphi_u)$

$\boxed{L = \frac{1}{C\omega^2} - \frac{(R+r)}{\omega} tg(\varphi_i - \varphi_u)}$

AN $L = \frac{1}{(2.10^{-6})(500\pi)^2} - \left(\frac{200+26,27}{500\pi}\right) tg\left(\frac{-\pi}{4}\right)$

$L = 0,347H$

3) a- $I_m = \frac{U_m}{Z}$; $I_{eff} = \frac{U_{eff}}{Z}$; I_{eff} est maximale $\Rightarrow$ Z est minimale

$Z = \sqrt{(R+r)^2 + (\frac{1}{C\omega} - L\omega)^2} \Rightarrow \frac{1}{C\omega} - L\omega = 0 \Rightarrow \omega = \omega_0 \Leftrightarrow N = N_0 = \frac{1}{2\pi\sqrt{LC}} = 191Hz$

Qarray.tn-Aqra Blech- Qarray.tn